Message

From: Brown, Chad (ECY) [CHBR461@ECY.WA.GOV]
Sent: 4/22/2014 5:09:35 PM
To: Szelag, Matthew [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f1e48230d96943f8acb72810e32ce8d6-Szelag, Matthew]
CC: mgil461@ECY.WA.GOV [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c7ab63dfcb56401284b16f8d24341337-mgil461@ECY.WA.GOV]; Patora, Kasia (ECY) [kpat461@ECY.WA.GOV]; cnie461@ecy.wa.gov [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=084bdcc64365427fa3795d176eb53d94-cnie461@ecy.wa.gov]
Subject: FW: Target List of 13 chemicals for tribal toxics study

Hi Matt,

Thanks for the follow-up email. This is the information that James provided last week. Cheryl, our Econ staff, and some Ecology toxicologists are reviewing the information now. They have James contact information if they want to ask further questions.

Cheryl and Kasia – do you think you will need any more assistance from EPA on this topic?

Chad

From: Covington, James [mailto:Covington.James@epa.gov]
Sent: Tuesday, April 15, 2014 10:12 AM
To: Brown, Chad (ECY)
Subject: FW: Target List of 13 chemicals for tribal toxics study

Good morning Chad,

Erik provided the information below. what additional information do you need?
If you would like to have another call, please let's set one up.

From: Helm, Erik
Sent: Monday, April 14, 2014 2:29 PM
To: Covington, James
Subject: RE: Target List of 13 chemicals for tribal toxics study

So do they want this kind of stuff from IRIS – it seems like they can google this as well as I can?

erik

Antimony; CASRN 7440-36-0

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the IRIS assessment development process. Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the guidance documents located on the IRIS website.

STATUS OF DATA FOR Antimony

File First On-Line 01/31/1987

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	on-line	02/01/1991
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	no data	

_I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

_I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — Antimony
CASRN — 7440-36-0
Last Revised — 02/01/1991

The oral Reference Dose (RfD) is based on the assumption that thresholds exist for certain toxic effects such as cellular necrosis. It is expressed in units of mg/kg-day. In general, the RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Please refer to the Background Document for an elaboration of these concepts. RfDs can also be derived for the noncarcinogenic health effects of substances that are also carcinogens. Therefore, it is essential to refer to other sources of information concerning the carcinogenicity of this substance. If the U.S. EPA has evaluated this substance for potential human carcinogenicity, a summary of that evaluation will be contained in Section II of this file.

__I.A.1. Oral RfD Summary

Critical Effect	Experimental Doses*	UF	MF	RfD
Longevity, blood glucose, and cholesterol Rat Chronic Oral Bioassay Schroeder et al., 1970	NOEL: none LOAEL: 0.35 mg/kg bw/day	1000	1	4E-4 mg/kg/day

*Conversion Factors: 5 mg/L (5 ppm) given as 0.350 mg/kg/day in the discussion section of the critical study

__I.A.2. Principal and Supporting Studies (Oral RfD)

Schroeder, H.A., M. Mitchner and A.P. Nasor. 1970. Zirconium, niobium, antimony, vanadium and lead in rats: Life term studies. J. Nutrition. 100: 59-66.

An experimental group of 50 male and 50 female rats was administered 5 ppm potassium antimony tartrate in water. Over the period of study, growth rates of treated animals were not affected, but male rats survived 106 and females 107 fewer days than did controls at median lifespans. Nonfasting blood glucose levels were decreased in treated males, and cholesterol levels were altered in both sexes. Since there was only one level of antimony administered, a NOEL was not established in this study. A decrease in mean heart weight for the males was noted. No increase in tumors was seen as a result of treatment. Although not precisely stated, the concentration of 5 ppm antimony was expressed as an exposure of 0.35 mg/kg/day by the authors.

__I.A.3. Uncertainty and Modifying Factors (Oral RfD)

UF — An uncertainty factor of 1000 (10 for interspecies conversion, 10 to protect sensitive individuals, and 10 because the effect level was a LOAEL and no NOEL was established) was applied to the LOAEL of 0.35 mg/kg bw/day.

MF — None

___I.A.4. Additional Studies/Comments (Oral RfD)

In a similar study (Kanisawa and Schroeder, 1969), groups of CD-1 mice (54/sex) were given potassium antimony tartrate in drinking water at 0 or 5 mg/L (5 ppm) for 540 days (18 months). Lifespans were significantly reduced in both males and females, but the degree of antimony toxicity was less severe in mice than rats. Bradley and Fredrick (1941) and Browning (1969) reported disturbances in glucose and cholesterol metabolism in rats ingesting 5 mg/L antimony, but no signs of injury to the heart were observed in rats receiving doses up to 100 mg/kg/day. Substantially higher doses of antimony trioxide were tolerated by rats in studies by Sunagawa (1981) and Gross et al. (1955a,b), suggesting a NOAEL of 500 mg/kg, but these studies are of inadequate duration to assess adverse effects on toxicity.

Seventy people became acutely ill after drinking lemonade containing 0.013% antimony (Dunn, 1928 and Monier-Williams, 1934). The lemonade had been prepared and left overnight in buckets coated with an enamel containing 2.88% antimony trioxide. Fifty-six people were taken to the hospital with burning stomach pains, colic, nausea and vomiting. Most recovered within 3 hours, but in some cases recovery was not complete for several days. It is estimated that a person consuming 300 mL of lemonade would have received a dose of approximately 36 mg antimony, or approximately 0.5 mg/kg for a 70-kg adult.

According to U.S. EPA (1980), multimedia antimony exposures are essentially negligible by comparison to occupational exposures at which discrete clinical health effects have been observed. Myocardial effects are among the best- characterized human health effects associated with antimony exposure. Studies by Brieger et al. (1954) suggest an inhalation NOEL for myocardial damage to be approximately 0.5 mg/cu.m. This exposure is approximately equivalent to an oral reference dose of 0.003 mg/kg bw/day (i.e., 0.5 mg/cu.m x 10 cu.m/day x 0.5 / 1.0 x 5 days/7 days / 70 kg / 10). Parallel studies in rats and rabbits resulted in observation of EKG alterations following exposure to 3.1-5.6 mg/cu.m. There are, however, no adequate data on oral exposure to antimony which permit reasonable estimate of no effect levels regarding heart damage.

One study (Belyaeva, 1967) indicated that women workers exposed in an antimony plant experienced a greater incidence of spontaneous abortions than did a control group of nonexposed working women. A high rate of premature deliveries among women workers in antimony smelting and processing was also observed (Aiello, 1955).

___I.A.5. Confidence in the Oral RfD

Study --Low
Database — Low
RfD — Low

Confidence in the chosen study is rated as low because only one species was used, only one dose level was used, no NOEL was determined, and gross pathology and histopathology were not well described. Confidence in the data base is low due to lack of adequate oral exposure investigations. Low confidence in the RfD follows.

___I.A.6. EPA Documentation and Review of the Oral RfD

U.S. EPA. 1980. Ambient Water Quality Criteria Document for Antimony. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Water Regulations and Standards, Washington, DC. EPA-440/5-80-020. NTIS PB 81- 117319.

The ADI in the 1980 Ambient Water Quality Criteria Document was extensively reviewed by the Agency and was reviewed by the public.

U.S. EPA. 1985. Health and Environmental Effects Profile for Antimony Oxides. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Solid Waste and Emergency Response, Washington, DC.

Limited peer review and extensive Agency-wide review, 1985.

Agency Work Group Review — 11/06/1985

Verification Date — 11/06/1985

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the RfD for Antimony conducted in September 2002 identified one or more significant new studies. IRIS users may request the references for those studies from the IRIS Hotline at hotline.iris@epa.gov or (202)566-1676.

__I.A.7. EPA Contacts (Oral RfD)

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in general, at (202)566-1676 (phone), (202)566-1749 (FAX) orhotline.iris@epa.gov (internet address).

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_I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)

Substance Name — Antimony
CASRN — 7440-36-0

Not available at this time.

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From: Covington, James
Sent: Friday, April 11, 2014 6:26 AM
To: Helm, Erik
Subject: FW: Target List of 13 chemicals for tribal toxics study

Good Morning Erik,

The write up is what I needed your help with.
Please give me a call once you had a chance to review.

Thanks a lot.
working from home today FYI
James C. Covington, III
OW/OST/EAD/EEAB
Senior Economist
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Washington, DC 20460
202 566-1034

From: Brown, Chad (ECY) <CHBR461@ECY.WA.GOV>
Sent: Thursday, April 10, 2014 8:10 PM
To: Covington, James
Cc: Szelag, Matthew; mgil461@ECY.WA.GOV
Subject: RE: Target List of 13 chemicals for tribal toxics study

James,

Thank you for the discussion yesterday. As we explained discuss, the Washington State rule-making process requires the agency to develop a cost/benefit analysis and determine that the probable benefits outweigh the probable costs of the rule. We meet that requirement through a qualitative, and where feasible, a quantitative analysis. We are attempting to provide quantitative information of health benefits with non-cancer chemicals, as we have with chems with a cancer risk based criterion. Our lead on the toxic criteria is out of the office and I am working with our economic staff on the development of the CBA. So, I am hoping to make the most sense with this request as possible.

Below is a list of chemicals for which we will be proposing a new criterion based on non-cancer effects (and for which we commonly have detections during our permitting processes). We would appreciate any information or thoughts on the health benefits/effect that may be quantifiable due to a further reduction (or in some cases potential increases) of these chemicals in receiving waters. We understand that quantifying benefits of threshold-effect chemicals may be difficult but if you or other staff have suggestions, we would appreciate the input.

The factors by which these criteria concentrations will increase or decrease have not yet been determined (due to ongoing policy discussions) however, if this is an important element to include, we can provide a possible scenario. Also, the inclusion of Arsenic and PCBs on this list may be confusing but we are seeking non-cancer effect information for other reasons.

Chemical
1,4 Dichlorbenzene
Antimony
Chloroform
Diethyl phthalate
Ethylbenzene
Arsenic
PCBs
Thallium
Toluene

Thank you for your help and please let us know if you have any questions.

Chad

Chad Brown | Water Quality Standards | WA Dept. of Ecology | 360-407-6128 | chad.brown@ecy.wa.gov

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From: Brown, Chad (ECY)
Sent: Wednesday, April 09, 2014 12:06 PM
To: 'Szelag, Matthew'
Subject: FW: Target List of 13 chemicals for tribal toxics study

Late list of chems…

These are some results from our preliminary work to identify chemicals that have been detected and/or where limits have been assigned,

Below is a combined list of chemicals that meet one of the follow criteria for inclusion on a list of chemicals that are most likely to drive new treatment requirements:

1. Already have a limit required in at least one permit
2. Have been identified as possibly triggering a new limit in a permit based on PP scan data review.
   (not all PP scans concentrations have been reassessed for Reasonable Potential Determination. So a few other chemicals could be added due to this reason.)
3. Is a chemical that is on the top 10 most detected chemicals. This is the list that I sent previously
   (Nickel was removed because current or potential limits would be based on Aquatic Life Criteria – as is the case with most metals)

It is important to note that depending on the final policy decisions, some of these chemical criteria may become less stringent due to many of the factors that we have already discussed (i.e. updated toxicity factors). Therefore, increased treatment beyond what is currently in place to meet the NTR criteria would not be necessary in those cases. We won't have the direction (up or down) of the criteria until the final policy decisions are made.
Please feel free to call or email if you have any questions.

Chemicals
1,4 Dichlorbenzene
3,3'-Dichlorobenzidine
4,4'-DDE
4,4'-DDT
Acrylonitrile
Antimony
Arsenic
Benzene
Benzo(a)Anthracene
Benzo(a)pyrene
Benzo(b)Fluoranthene
Benzo(k)fluoranthene
Bis(2-Chloroethyl)Ether
Bis(2-ethylhexyl) Phthalate
Chrysene
Cyanide

Dibenzo (a,h) Anthracene
Dibenzo(a,h)anthracene
Dichlorobromomethane
Diethyl phthalate
Di-n-Butyl Phthalate
Ethylbenzene
Mercury
Methylene chloride
N-Nitrosodi-n-Propylamine
PCBs
Pentachlorophenol
Tetrachloroethylene
Thallium
Toluene
Vinyl chloride

From: Char Naylor [mailto:char.naylor@puyalluptribe.com]
Sent: Wednesday, March 19, 2014 10:07 AM
To: Brown, Chad (ECY); Serdar, Dave (ECY); Gildersleeve, Melissa (ECY); Niemi, Cheryl (ECY)
Cc: Braley, Susan (ECY)
Subject: RE: Target List of 13 chemicals for tribal toxics study

Thanks so much Chad….

From: Brown, Chad (ECY) [mailto:CHBR461@ECY.WA.GOV]
Sent: Tuesday, March 18, 2014 1:26 PM
To: Serdar, Dave (ECY); Gildersleeve, Melissa (ECY); Niemi, Cheryl (ECY)
Cc: Char Naylor; Braley, Susan (ECY)
Subject: FW: Target List of 13 chemicals for tribal toxics study
Importance: High

Forwarding to Susan (email went to Susi Bragg)

Dave, below are the chemicals that we identified from the permits that we looked at. Would you add any based on your larger review of PARIS permit data?

Antimony
Bis(2-ethylhexyl) phthalate
Cyanide
1,4 Dichlorbenzene
Diethyl phthalate
Methylene chloride
Nickel
Tetrachloroethylene
Toluene

From: Char Naylor [mailto:char.naylor@puyalluptribe.com]
Sent: Tuesday, March 18, 2014 10:29 AM
To: Gildersleeve, Melissa (ECY); Niemi, Cheryl (ECY); Brown, Chad (ECY)
Cc: Bragg, Susan (ECY)

Subject: Target List of 13 chemicals for tribal toxics study
Importance: High

In addition to those 4 chemicals listed by HDR in their treatment analysis (PCBs, mercury, arsenic, and benzo(a)oyrene, do you guys have suggestions for the other 9 target chemicals? The project is moving forward, so please let us know as soon as you can if you have thoughts and as always, thank you.

Char Naylor
Puyallup Tribe of Indians
Water Quality Manager
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